AMENDMENTS TO THE CLAIMS

Please amend claims 1-4, 8-16, 19, 21-26, 28, 30 and 33 as follows.

1. (Currently amended) A laser apparatus comprising:

a gain medium having first and second output facets;

a reflector, said reflector and said second output facet defining an external cavity;

an optical output assembly optically coupled to said second output facet;

a first thermally conductive substrate, said gain medium and said optical output assembly mounted on said first thermally conductive substrate;

a thermoelectric controller joined to said first thermally conductive substrate, said gain medium and said optical output assembly configured to be thermally controlled by said thermoelectric controller via thermal conduction through said first substrate; and

said reflector ~~positioned remotely from said thermally conductive substrate and said thermoelectric controller~~ mounted on a second substrate, said second substrate thermally isolated from said first thermally conductive substrate and thermally controlled independently from said first thermally conductive substrate.

2. (Currently amended) The laser apparatus of claim 1, wherein said first thermally conductive substrate has a coefficient of thermal expansion matched to that of said gain medium.

3. (Currently amended) The laser apparatus of claim 1, further comprising:

a channel selector;

a tuning assembly operatively coupled to said channel selector and configured to adjust said channel selector; and

said channel selector and said tuning assembly positioned remotely from said first thermally conductive substrate.

4. (Currently amended) The laser apparatus of claim 1, further comprising a first collimating lens optically coupled to said first output facet, said first collimating lens mounted on said first thermally conductive substrate and configured to be thermally controlled by said thermoelectrical controller by thermal conduction through said first thermally conductive substrate.

5. (Original) The laser apparatus of claim 1, wherein said output assembly comprises a second collimating lens optically coupled to said second output facet.

6. (Original) The laser apparatus of claim 4, wherein said optical output assembly further comprises and optical isolator, said optical isolator optically coupled to said second collimating lens.

7. (Previously amended) The laser apparatus of claim 4, wherein said optical output assembly further comprises a fiber focus lens, said fiber focus lens optically coupled to said optical isolator and to an optical fiber.

8. (Currently amended) The laser apparatus of claim 1, further comprising a thermistor operatively coupled to said first thermally conductive substrate and said thermoelectrical controller.

9. (Currently amended) The laser apparatus of claim 1, further comprising a grid etalon, said grid etalon mounted on said first thermally conductive substrate.

10. (Currently amended) The laser apparatus of claim 4, wherein said optical output assembly further comprises a coarse spectrometer, said course spectrometer mounted on said first thermally conductive substrate.

11. (Currently amended) The laser apparatus of claim 1, wherein said gain medium, said optical output assembly, said first thermally conductive substrate and said thermoelectric controller are hermetically sealed in an inert atmosphere.

12. (Currently amended) The laser apparatus of claim 1, wherein said first thermally conductive substrate comprises a material selected from aluminum nitride, silicon carbide, and a silicon carbide/aluminum nitride alloy.

13. (Currently amended) The external cavity laser apparatus of claim 3, wherein ~~said reflector,~~ said channel selector and said tuning assembly are mounted on ~~a~~ said second substrate.

14. (Currently amended) An external cavity laser apparatus comprising:

a gain medium having first and second output facets, said gain medium ~~emitting~~ to emit a first coherent beam from said first output facet along a first optical path and a second coherent beam from said second output facet along a second optical path;

an end mirror positioned in said first optical path, said end mirror and said second output facet defining an external cavity;

an optical output assembly positioned in said second optical path;

a first thermally conductive substrate, said gain medium and said optical output assembly mounted on said first thermally conductive substrate;

a thermoelectric controller joined to said first thermally conductive substrate, said gain medium and said optical output assembly thermally coupled to said thermoelectric controller by said first thermally conductive substrate; ~~and~~

said end mirror ~~thermally isolated from said thermoelectric controller~~ mounted on a second substrate, said second substrate thermally isolated from said first thermally conductive substrate and thermally controlled independently from said first thermally conductive substrate; and

a grid etalon mounted on said second substrate and positioned in said first optical path between said first output facet and said end mirror.

15. (Currently amended) The external cavity laser apparatus of claim 14, wherein said first thermally conductive substrate has a coefficient of thermal expansion matched to that of said gain medium.

16. (Currently amended) The external cavity laser apparatus of claim 14, further comprising:

a channel selector positioned in said first optical path between said first output facet and said end mirror;

a tuning assembly operatively coupled to said channel selector and configured to adjust said channel selector; and

said channel selector and said tuning assembly thermally isolated from said first thermally conductive substrate and said thermoelectric controller.

17. (Previously amended) The external cavity laser apparatus of claim 16, wherein:

said channel selector comprises a wedge etalon; and

said tuning assembly comprises a stepper motor configured to positionally adjust said wedge etalon in said first optical path.

18. (Original) The external cavity laser of claim 17, wherein said tuning assembly further comprises an optical encoder configured to monitor positioning of said stepper motor and said wedge etalon.

19. (Currently amended) The external cavity laser apparatus of claim 14, further comprising a first collimating lens positioned in said first optical path proximate to said first output facet, said first collimating lens mounted on said first thermally conductive substrate and thermally coupled to said thermoelectric controller through said first thermally conductive substrate.

20. (Previously amended) The external cavity laser apparatus of claim 14, wherein said optical output assembly comprises:

a fiber focusing lens positioned in said second optical path and optically coupled to a fiber;

a second collimating lens positioned in said second optical path between said second output facet and said fiber focusing lens; and

an optical isolator positioned in said second optical path after said second collimating lens and before said fiber focusing lens.

21. (Currently amended) The external cavity laser apparatus of claim 20, further comprising a grid etalon mounted on said first thermally conductive substrate and thermally coupled to said thermoelectric controller, said grid etalon positioned in said second optical path after said second collimating lens.

22. (Currently amended) ~~An~~ The external cavity laser apparatus of claim 20, further comprising a coarse spectrometer mounted on said first thermally conductive substrate and thermally coupled to said thermoelectric controller, said coarse spectrometer positioned in said second optical path after said second collimating lens.

23. (Currently amended) An external cavity laser apparatus comprising:

a gain medium having first and second output facets, said gain medium emitting a first coherent beam from said first output facet along a first optical path

and a second coherent beam from said second output facet along a second optical path;

an end mirror positioned in said first optical path, said end mirror and said second output facet defining an external cavity;

an optical output assembly positioned in said second optical path;

a first thermally conductive substrate, said gain medium and said optical output assembly mounted on said first thermally conductive substrate;

a first thermoelectric controller joined to said first thermally conductive substrate, said gain medium and said optical output assembly thermally coupled to said first thermoelectric controller by said first thermally conductive substrate; and

said end mirror ~~positioned to allow said thermoelectric controller to thermally control said gain medium and said optical output assembly independently from said end mirror~~ mounted on a second substrate thermally isolated from said first thermally conductive substrate and thermally controlled by a second thermoelectric controller coupled to said second substrate.

24. (Currently amended) The external cavity laser apparatus of claim 23, further comprising:

a channel selector positioned in said first optical path between said first output facet and said end mirror;

a tuning assembly operatively coupled to said channel selector and configured to adjust said channel selector; and

said channel selector and said tuning assembly positioned to allow said first thermoelectric controller to thermally control said gain medium and said optical output assembly independently from said channel selector and said tuning assembly.

25. (Currently amended) A laser apparatus comprising:

a gain medium having first and second output facets;

an end mirror optically coupled said first output facet;

an optical output assembly optically coupled to said second output facet;

a first substrate, said first substrate being thermally conductive, said gain medium and said optical output assembly mounted on said first substrate;

a thermoelectric controller joined to said first substrate, said gain medium and said optical output assembly configured to be thermally controlled by said thermoelectric controller via thermal conduction through said first substrate; and

a second substrate, said end mirror positioned on said second substrate and thermally ~~isolated from said thermoelectric controller~~ controlled independently from said first substrate.

26. (Currently amended) A laser apparatus, comprising:

a gain medium having first and second output facets;

an end mirror optically coupled to said first output facet and thermally isolated from said gain medium; and

a thermoelectric controller thermally coupled to said gain medium and configured to thermally control said gain medium independently from said end mirror.

27. (Original) The laser apparatus of claim 26, further comprising an optical output assembly optically coupled to said second output facet and thermally coupled to said thermoelectric controller, said thermoelectric controller configured to thermally control said optical output assembly.

28. (Currently amended) A method of selectively cooling a laser apparatus comprising:

providing a gain medium having first and second output facets, an end mirror optically coupled to said first output facet, and an optical output assembly optically coupled to said second output facet; and

thermally controlling ~~said gain medium and said optical output assembly independently from~~ said end mirror independently from said gain medium and said optical output assembly.

29. (Previously amended) The method of claim 28, wherein said thermally controlling comprises:

mounting said gain medium and said optical output assembly on a first, thermally conductive substrate, said first, thermally conductive substrate coupled to a thermoelectric controller; and

mounting said end mirror on a second substrate that is thermally isolated from said first substrate and said thermoelectric controller.

26 ~~30~~. (Currently amended) A laser apparatus, comprising:

a gain medium;

a reflector, said reflector and an output facet of said gain medium defining a laser cavity;

an optical output assembly optically coupled to said gain medium, the optical output assembly to optically couple an optical signal from the output facet of the gain medium to an optical fiber, the optical output assembly comprising:

a collimating lens optically coupled to said output facet of said gain medium; and

a fiber focus lens optically coupled between said collimating lens and said optical fiber; and

means for providing selective thermal control to said optical output assembly independently from said reflector.

27 ~~31~~. (Previously amended) The laser apparatus of claim 26 ~~30~~, further comprising means for providing selective thermal control to said gain medium independently from said reflector.

28 ~~32~~. (Previously amended) The laser apparatus of claim 26 ~~30~~, wherein said means for providing selective thermal control to said optical output assembly comprises:

a thermally conductive substrate, said optical output assembly mounted on said thermally conductive substrate; and

a thermoelectric controller joined to said thermally conductive substrate, said optical output assembly configured to be thermally controlled by said thermoelectric controller via thermal conduction through said substrate.

~~38~~ 29. (Currently amended) The laser apparatus of claim ~~31~~ 27, wherein said means for providing selective thermal control to said gain medium comprises:

a thermally conductive substrate, said gain medium mounted on said thermally conductive substrate; and

a thermoelectric controller joined to said thermally conductive substrate, said gain medium configured to be thermally controlled by said thermoelectric controller via thermal conduction through said thermally conductive substrate.